



Analysis of Community Dependence on Recreational Fishing

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Overview

- Context and methods
 - Social indicators of coastal community vulnerability and resilience
- Measurement
 - Social indicators of community vulnerability
 - Indicators of community dependence on recreational and commercial fishing
- Tools available to public



Applications

- MSA Mandated analysis of the potential effects of regulatory change on ***place based*** communities
 - Social Impact Assessment
 - National Standard 8
 - Environmental Justice
- Hurricane Sandy Rapid Assessment
 - Locate recreational and commercial dependent communities

- 2,917 communities in coastal counties in the Eastern US and Gulf Coast (context)
- Over 1,000 with commercial and/or recreational activity
- 19 states
 - North Carolina shared
- 75 variables
- 7 different secondary sources

Scope



Social Indicators for Fishing Communities
NE & SE United States



Albers Projection
Central Meridian: -26
1st Std Parallel: 20
2nd Std Parallel: 60
Latitude of Origin: 40

Criteria for indices

- Used the following criteria to qualify indices that emerged:
 - Principal component analysis
 - Single factor solution
 - Factor loadings above .350
 - Variance explained 45%
 - Kaiser-Meyer-Olkin measure of sampling adequacy above .500
 - Bartlett's test of sphericity significance above .05
 - Theta reliability above .500
 - 14 indices



Social vulnerability

- Is the pre-existing condition that affects a community's (social system) ability to prepare for and recover from a disruptive event.
- Inherent characteristics of the community that create the potential for harm



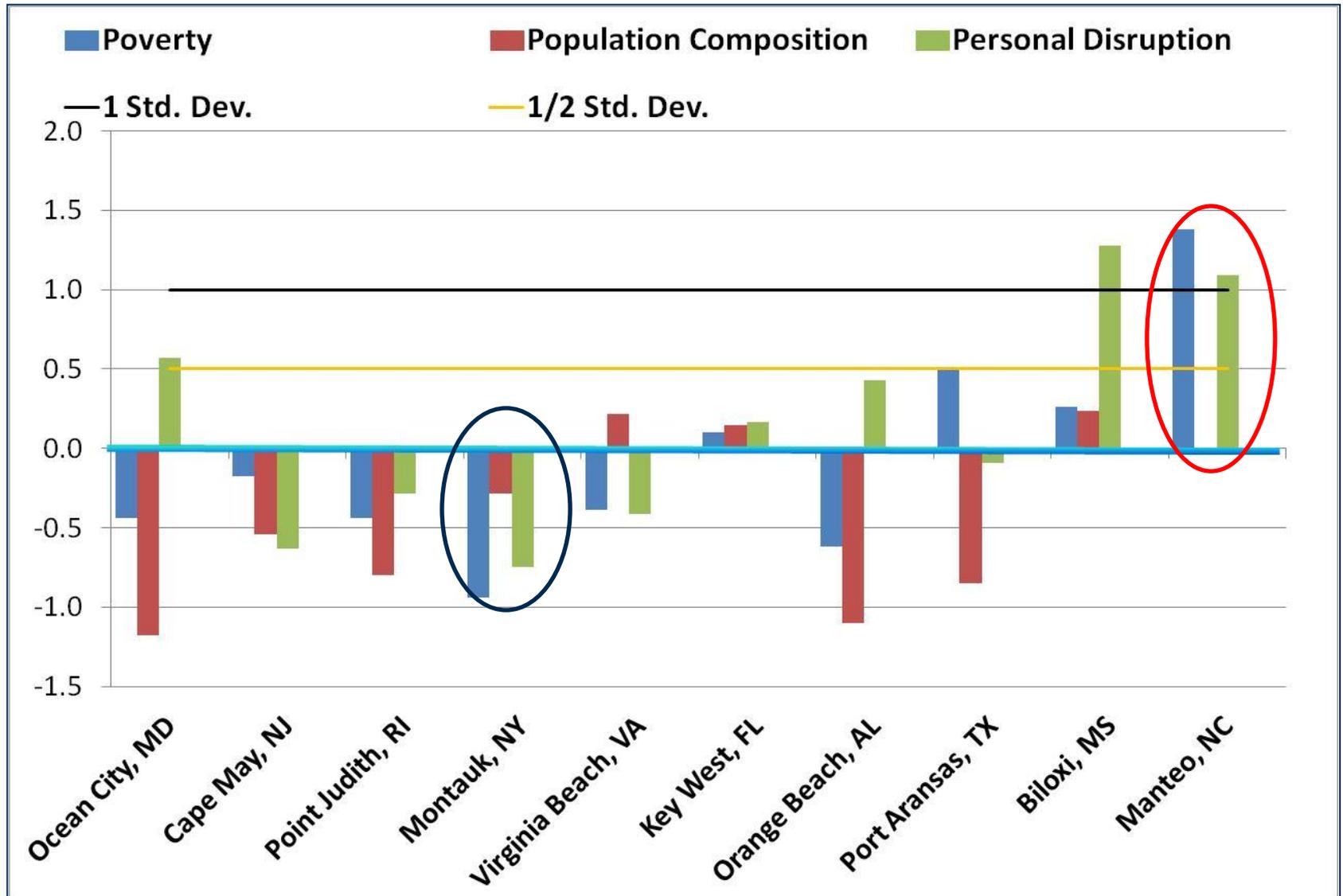
Social vulnerability indices

- **Poverty**
- **Personal disruption**
- **Population composition vulnerability**

Social vulnerability indices

Indices	Factor Loadings	% Variance Explained
Poverty		
% receiving assistance	0.544	59.72
% of families below poverty level	0.915	
% over 65 in poverty	0.716	
% under 18 in poverty	0.862	
Personal Disruption		
% unemployed	0.628	45.00
Crime index	0.477	
% with no diploma	0.786	
% in poverty	0.811	
% females separated	0.600	
Population Composition Vulnerability		
% white alone	-0.898	58.12
% female single headed households	0.719	
% Population age 0-5	0.675	
% Speak English less than well	0.739	

Social Vulnerability



Gentrification pressure indices



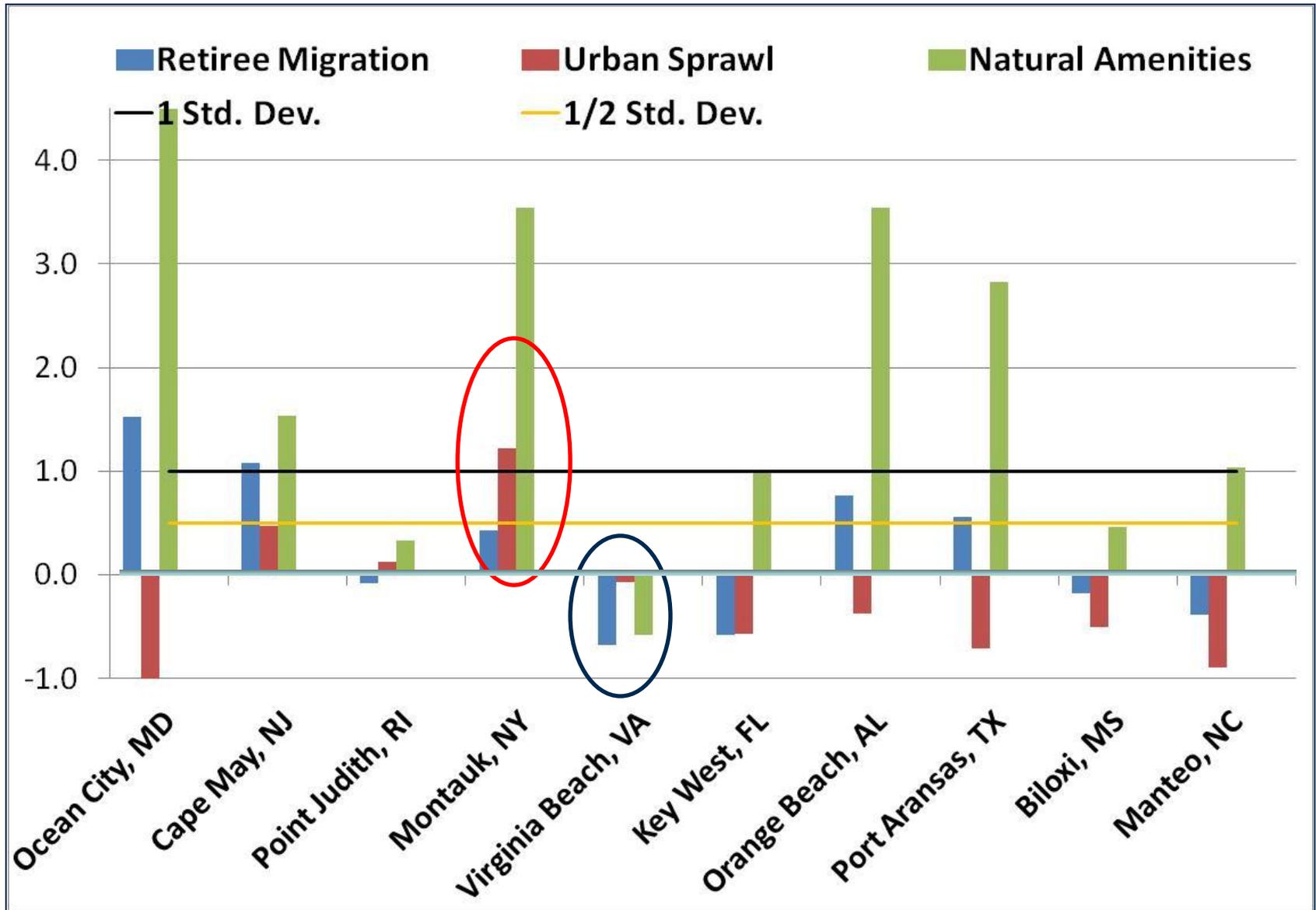
- Retiree migration
- Urban sprawl
- Natural amenities



Gentrification pressure indices

Indices	Factor Loadings	% Variance Explained
Retiree Migration		
Households with one or more over 65	0.950	78.58
% receiving social security	0.951	
% receiving retirement income	0.766	
% in labor force	-0.866	
Urban Sprawl		
Population density	0.387	49.32
Nearest city (in miles) with a population of 50,000	-0.589	
Cost of living index	0.894	
Median home value	0.819	
Natural Amenities		
Rental vacancy rate	0.770	47.15
% homes vacant	0.824	
Boat launches by population	0.605	
% water cover	0.493	

Gentrification Pressure Vulnerability



Fishing dependence indices

- **Recreational**

- Recreational fishing engagement
- Recreational fishing reliance



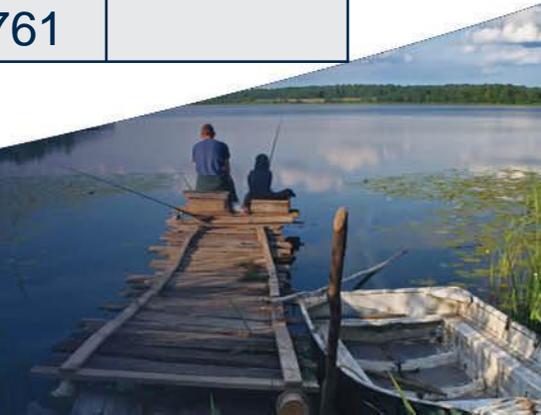
- **Commercial**

- Commercial fishing engagement
- Commercial fishing reliance



Recreational fishing indices

Indices	Factor Loadings	% Variance Explained
Recreational Fishing Reliance		
Recreational fishing mode charter by population	0.352	58.97
Recreational fishing mode private by population	0.917	
Recreational fishing mode shore by population	0.897	
Recreational Fishing Engagement		
Recreational charter fishing pressure	0.352	63.02
Recreational private fishing pressure	0.815	
Recreational shore fishing pressure	0.761	



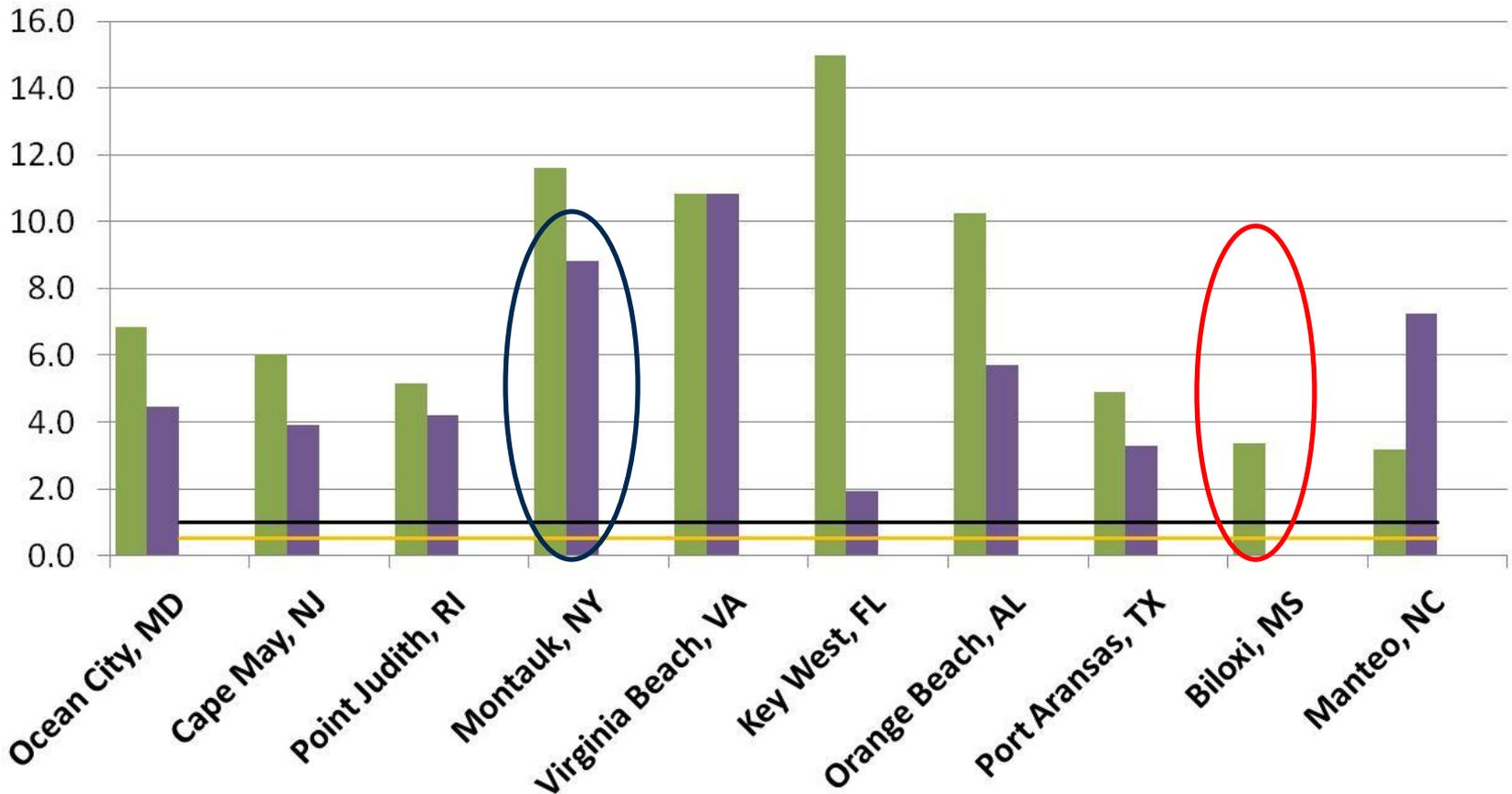
Recreational Fishing Dependence

■ Recreational Fishing Engagement

■ Recreational Fishing Reliance

— 1 Std. Dev.

— 1/2 Std. Dev.

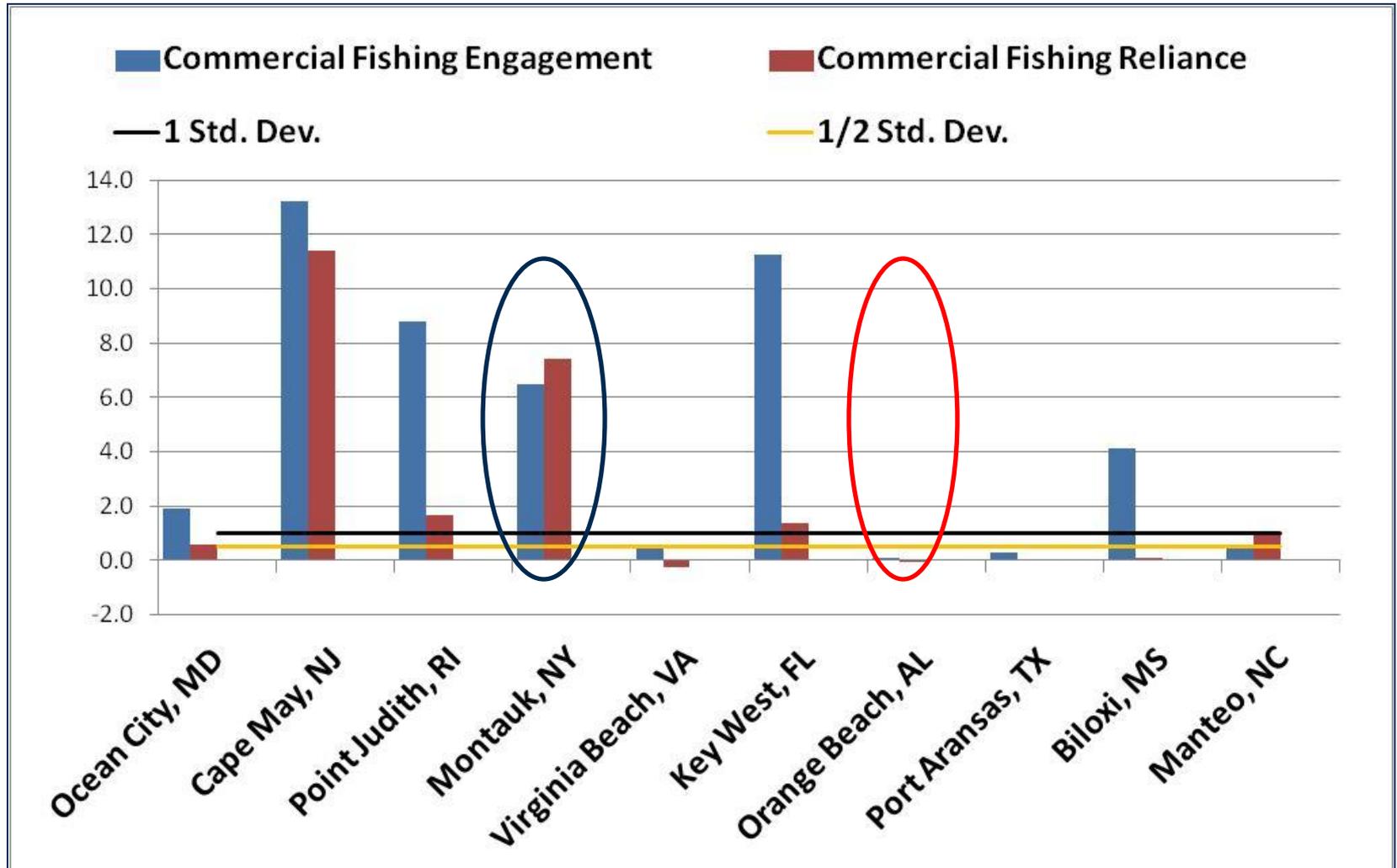


Commercial fishing indices

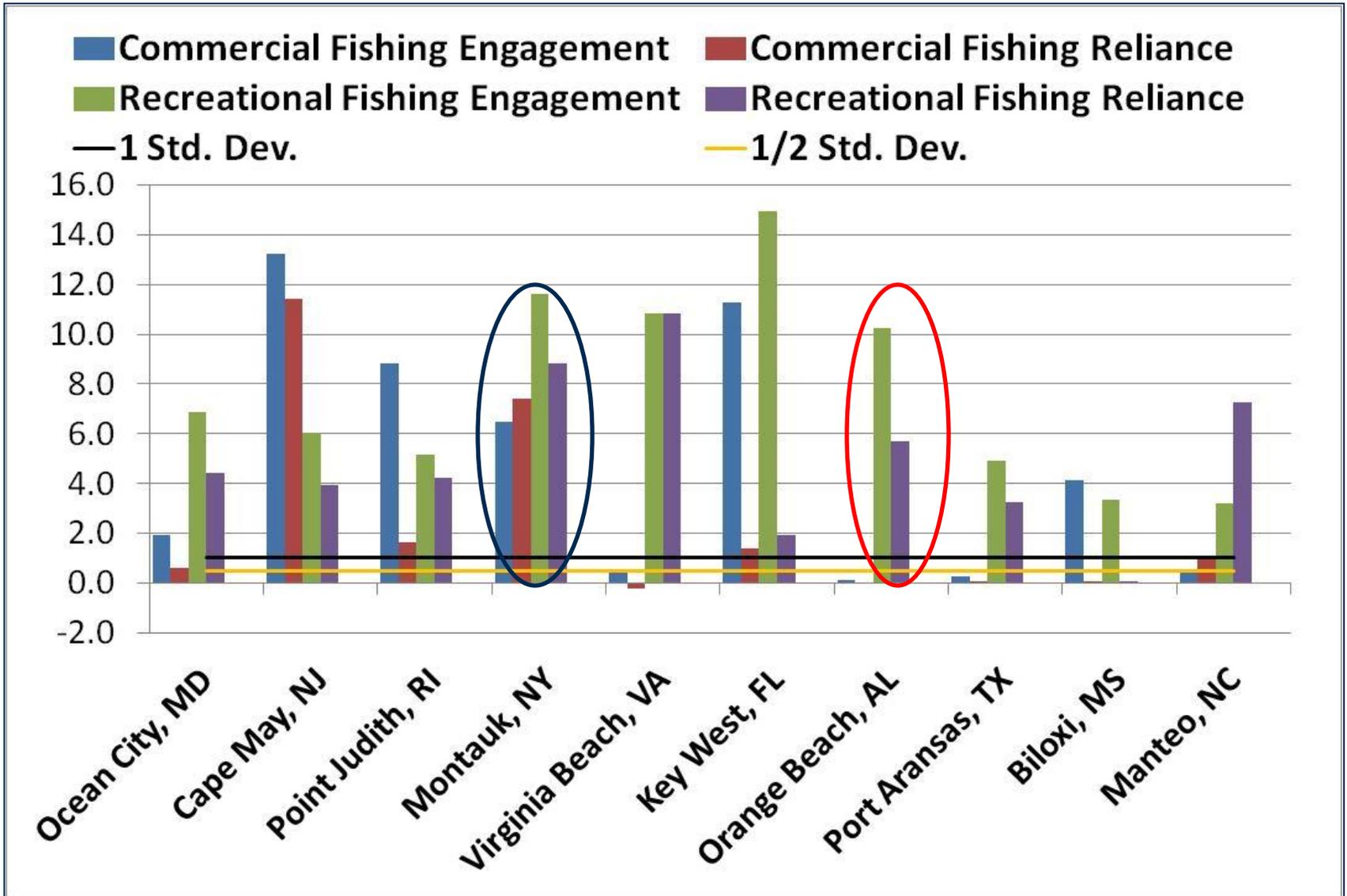
Indices	Factor Loadings	% Variance Explained
Commercial Fishing Reliance		
Value of landings by population	0.833	50.30
Number of commercial fishing permits by population	0.686	
Dealers with landings by population	0.592	
% in forestry, farming and fishing occupation	0.705	
Commercial Fishing Engagement		
Value of landings	0.906	57.57
Number of commercial fishing permits	0.862	
Number of dealers with landings	0.580	
Pounds of landings	0.635	



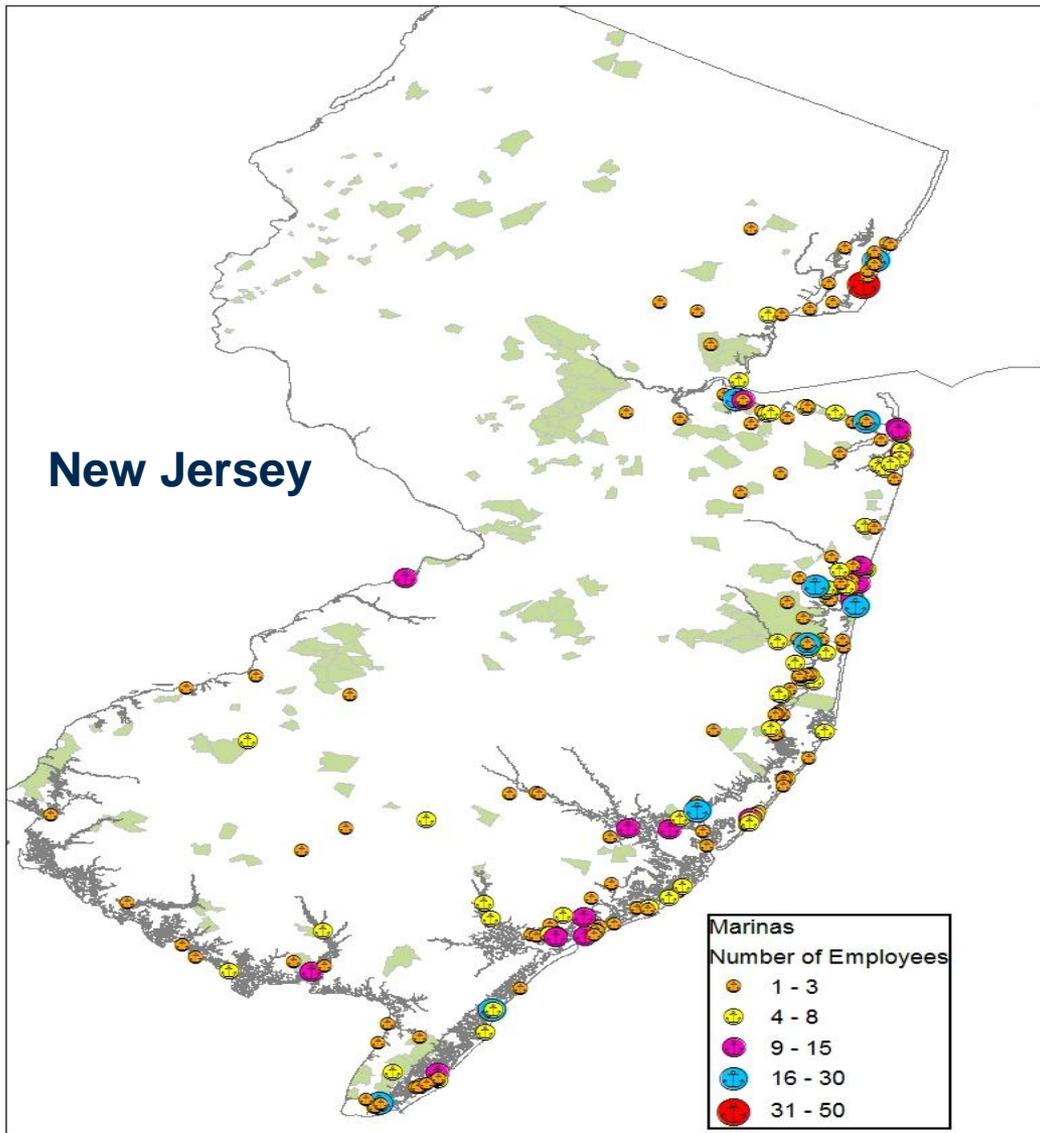
Commercial dependence



Combined fishing dependence



Fishing Infrastructure Index

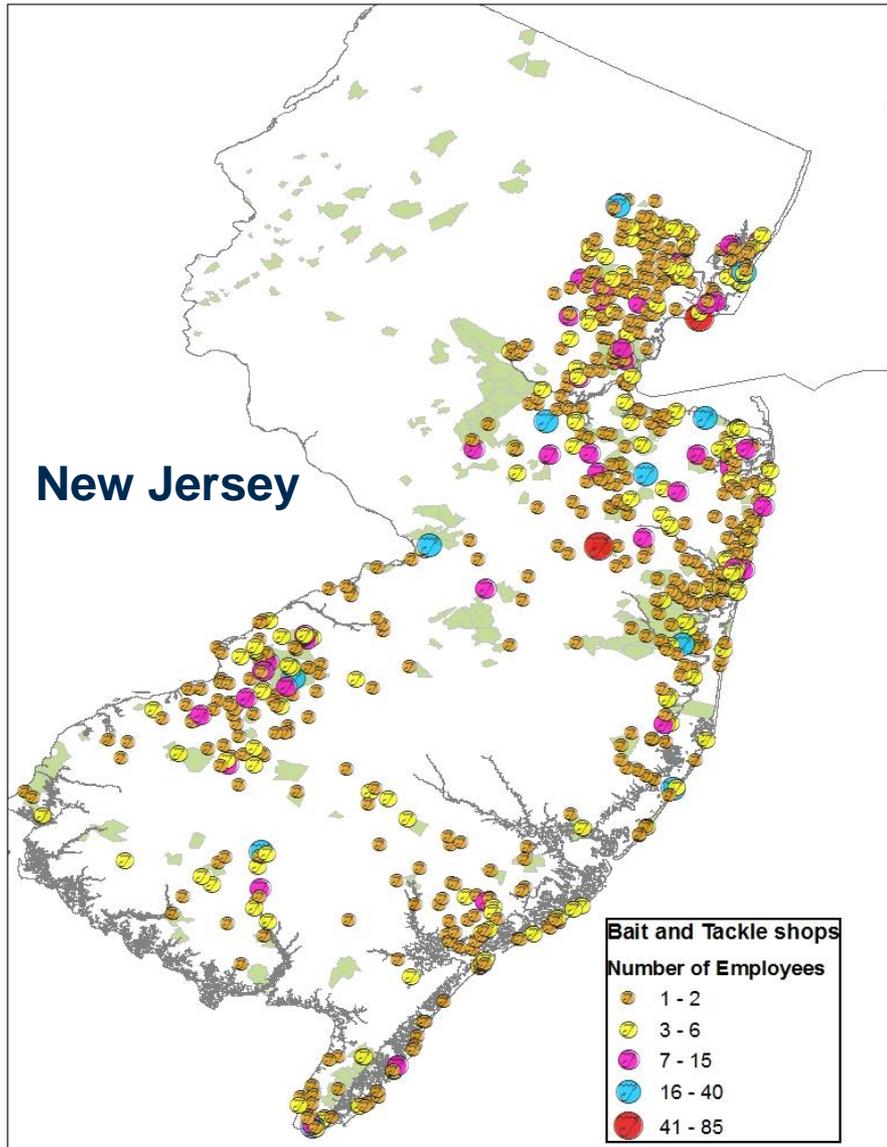


Marinas

-Number of Employees-



Recreational Fishing Infrastructure



Bait and Tackle Stores

-Number of Employees-



Web based interactive mapping tool for use in SIA

The screenshot shows the NOAA Office of Science and Technology website. The top navigation bar includes links for NOAA HOME, WEATHER, OCEAN, FISHERIES, CHARTING, SATELLITE, CLIMATE, RESEARCH, COASTS, and CAREERS. The main header features the NOAA logo and the text "NOAA OFFICE OF SCIENCE AND TECHNOLOGY NATIONAL MARINE FISHERIES SERVICE". A left sidebar menu lists various topics: S&T Home, Recreational Fisheries Statistics, Commercial Fisheries Statistics, Cooperative Research, Observer Program, Marine Mammals & Turtles, Ecosystems, Stock Assessments, Economics, Human Dimensions, Apps & Tech, About Us, and Contact Us. The main content area is titled "About Social Indicators" and features a large image of a fishing boat on a pier. Below the image is a paragraph explaining that social indicators are numerical measures of well-being. To the right, there are sections for "Social Indicator Links" (About the Indicators, Explore the Indicators, Indicator Definitions, Community Vulnerability, Indicator Development), "Supporting Links" (Indicator Publications, Supporting Information, Contact Us), and "Technical Memo" (Development of Social Indicators of Fishing Community Vulnerability and Resilience in the U.S. Southeast and Northeast Regions). At the bottom, three columns provide further resources: "Explore the Indicators" with an interactive map, "Indicator Definitions" with a photo of fishing boats, and "Community Vulnerability" with a conceptual diagram.

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About Social Indicators

Social Indicators are numerical measures that describe the well-being of individuals or communities. Indicators are comprised of one variable or several components combined into an index. They are used to describe and evaluate community well-being in terms of social, economic and psychological welfare. To learn more, see [Indicator development](#).

Social Indicator Links

- [About the Indicators](#)
- [Explore the Indicators](#)
- [Indicator Definitions](#)
- [Community Vulnerability](#)
- [Indicator Development](#)

Supporting Links

- [Indicator Publications](#)
- [Supporting Information](#)
- [Contact Us](#)

Technical Memo

[Development of Social Indicators of Fishing Community Vulnerability and Resilience in the U.S. Southeast and Northeast Regions](#)

Explore the Indicators

Check out the [Interactive map](#) of social indicators to see where your community ranks among other communities.

Indicator Definitions

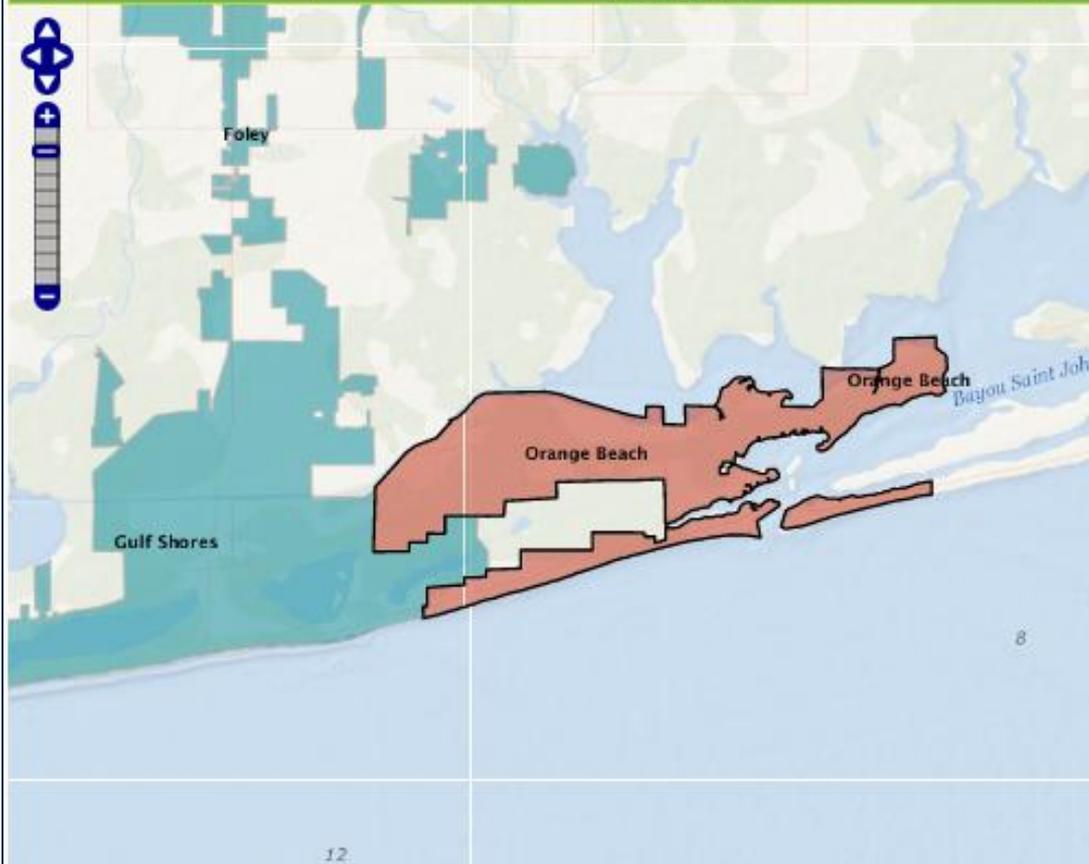
Curious to learn more? Check out [Indicator definitions](#) to see what the indicators mean.

Community Vulnerability

Indicators help to gauge community vulnerability and resilience to change. See our [conceptual diagram](#) and [example](#) to learn more.

Community Social Indicators

Click on a community in the map or type in a community name:



Indices for Orange Beach, AL. Click on an index name to compare communities.

Social Vulnerability		Gentrification Pressure		Fishing Engagement and Reliance	
Labor Force	Medium	Housing Disruption	High	Commercial Fishing Engagement	Low
Housing Characteristics	Low	Retiree Migration	Medium	Commercial Fishing Reliance	Low
Poverty	Low	Urban Sprawl	Low	Recreational Fishing Engagement	High
Population Composition	Low	Natural Amenities	High	Recreational Fishing Reliance	High
Personal Disruption	Low				

Recreational fishing dependence in context

Continuing work:

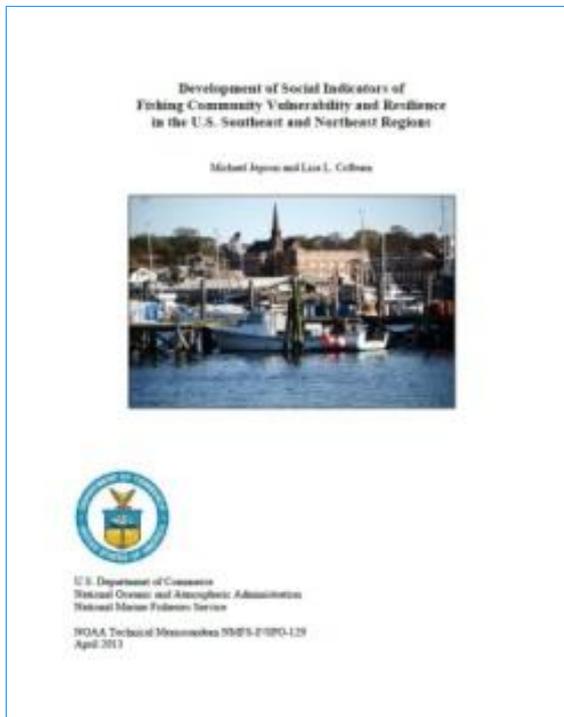
- **Refine recreational fishing index**
 - Replace MRIP site pressure data with regular intercept data on angler trips (stratify to get trips/community)
- **Indices under development**
 - Fishing Infrastructure
 - Species specific
 - Vulnerable species
 - Climate change
- **Time series analysis**
- **National standardized indicators**



Web accessible resources

(<http://www.st.nmfs.noaa.gov/humandimensions/social-indicators/index>)

Tech Memo



Mapping tool



Data available on request

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